**+Philippe R.-G. Piot**
Professor of Physics
Northern Illinois University
DeKalb, IL 60115
Scientist I, Accelerator Physics Center
Fermi National Accelerator Laboratory
Batavia, IL 60115

Voice (NIU): (815) 753-6473
Voice (FNAL): (840) 630-6389
Fax (NIU): (815) 753-1712
E-mail: piot@nicadd.niu.edu

## I. Professional Preparation:

| | | | |
|---|---|---|---|
| Deutches Electronen Synchrotron DESY, Germany | accelerator physics | posdoc | 2000-2002 |
| Thomas Jefferson National Laboratory | accelerator physics | postdoc | 1999-2000 |
| Universite de Grenoble I (research at JLab) | accelerator physics | Ph.D. | 1999 |
| Universite de Grenoble I, France (research at Saclay) | accelerator physics | Master | 1995 |
| Universite de Nice-Sophia-Antipolis, France | mathematics/physics | Bachelor | 1993 |

## II. Appointments:

| | | |
|---|---|---|
| Professor | Northern Illinois University | 08/2011-present |
| Associate Professor | Northern Illinois University | 08/2005-08/2011 |
| Scientist I | Fermi National Accelerator Laboratory | 10/2009-present |
| Visiting Fellow | Argonne Accelerator Institute, ANL | 01/2007-present |
| Associate Scientist (Peoples Fellow) | Fermi National Accelerator Laboratory | 11/2002-08/2005 |

## III. Research Interests:

My past and current research efforts focus on charged-particle beam physics, with particular emphasis on the generation, manipulation, diagnosis and potential use of bright electron beams. I have been conducting research in Beam Physics and Accelerator Technology for the last 17 years. During my doctoral dissertation I investigated beam dynamics and developed diagnostics for the CEBAF and IR-Demo free-electron laser (FEL) accelerators at Thomas Jefferson National Laboratory. While a postdoc at DESY, I developed a staged approach for the generation of electron bunches and their low-energy transport for the European X-ray FEL in construction in Hamburg, Germany. The technique was implemented at the FLASH facility and resulted in the "lasing" of a self-amplified stimulated-emission FEL at 16 nm. At Fermilab, I co-led the experimental program of a small facility dedicated to R&D in advanced accelerator physics (the A0 Photoinjector). My primary contribution was the generation and characterization of flat beams using a novel phase-space tranformation between the two transverse degrees of freedom. Since 2005 I hold a joint appointment as a faculty at Northern Illinois University and staff scientist at Fermilab. My current research centers on the development of table-top accelerators. As part of this research effort I am exploring theoretically and experimentally new phase space manipulation concepts aimed at redistributing the beam emittance between the three degrees of freedom or tailoring the current profile of electron bunches. The experiments are (or will be) carried out at the A0 photoinjector, the High-Brightness Electron Source Laboratory (HBESL), the Advanced Superconducting Accelerator (ASTA) located at Fermilab and the Argonne Wakefield Accelerator (AWA). Ultimate applications of these phase-space-redistribution methods include high-gradient (GV/m) beam-driven acceleration and table-top accelerator-based coherent light sources.

## IV. Ten Representative Publications:

(see also http://inspirehep.net/search?ln=en&p=find+a+p+piot&of=hb&action_search=Search )


- P. Piot, C. Behrens, C. Gerth, M. Dohlus, F. Lemery, D. Mihalcea, P. Stoltz, M. Vogt, "Generation and characterization of electron bunches with ramped current profiles in a dual-frequency superconducting linac", *Physical Review Letters* **108**, 034801 (2012)
- C. A. Brau, B.-K. Choi, J. D. Jarvis, L. W. Lewellen, and P. Piot, "Channeling radiation as a source of hard x-rays with high spectral brilliance", *Synchrotron Radiation News* **25** (1), 20 (2012).

- P. Piot, Y.-E Sun, T.J. Maxwell, A. H. Lumpkin, J. Ruan, M. M. Rihaoui, R. Thurman-Keup, T.J. Maxwell, J. Ruan, R. Thurman-Keup, "Observation of Coherently-Enhanced Terahertz Transition Radiation Produced by a Relativistic Train of Electron Bunch", *Applied Physics Letters* **98** 261501 (2011).
- Y.-E Sun, P. Piot. A. S. Johnson, A. H. Lumpkin, T. Maxwell, J. Ruan, R. Thurman-Keup, "Tunable Subpicosecond Electron-Bunch-Train Generation Using a Transverse-to-Longitudinal Phase-Space Exchange Technique", *Physical Review Letters* **105**, 234801 (2010)
- C. Prokop, P. Piot, M.-C. Lin, P.. Stoltz, "Numerical modeling of a table-top tunable Smith–Purcell terahertz free-electron laser operating in the super-radiant regime", *Applied Physics Letters* **96**, 151502 (2010).
- P. Piot, Y.-E Sun, K.-J. Kim, "Photoinjector Production of a Flat Beam with Transverse Emittance Ratio of 100", *Physical Review Special Topics, Accelerators and Beams* **9**, 031001 (2006).
- P. Emma, Z. Huang, K.-J. Kim and P. Piot, "Transverse-to-longitudinal emittance exchange to improve performance of high-gain free-electron lasers", *Physical Review Special Topics, Accelerators and Beams* **9**, 100702 (2006).
- Y.-E Sun, P. Piot, K.-J. Kim, N. Barov, S. Lidia, J. Santucci, R. Tikhoplav, J. Wennerberg, "Generation of angular-momentum-dominated electron beams from a photoinjector", *Physical Review Special Topics, Accelerators and Beams* **7**, 123501 (2004).
- B. Faatz, A.A. Fateev, K. Flottmann, D. Nolle, P. Piot, E.L. Saldin, H. Schlarb, E.A. Schneidmiller, S. Schreiber, D. Sertore, K.P. Sychev, M.V. Yurkov, "Vacuum-ultraviolet free-electron-laser-driven radiofrequency-gun", *Nuclear Instrument and Methods Section A* **507**, 350 (2003).
- G. R. Neil, C. L. Bohn, S. V. Benson, G. Biallas, D. Douglas, H. F. Dylla, R. Evans, J. Fugitt, A. Grippo, J. Gubeli, R. Hill, K. Jordan, G. Krafft, R. Li, L. Merminga, P. Piot, J. Preble, M. Shinn, T. Siggins, R. Walker, B. Yunn, "Sustained Kilowatt Lasing in a Free-Electron Laser with Same-Cell Energy Recovery", *Physical Review Letters* **84**, 662 (2000).

## V. Recent Synergistic Activities:

1. Interim director, Northern Illinois Center for Accelerator & Detector Development (NICADD), 2011-present,
2. Member, scientific advisory board, 2012 International Particle Accelerator Conference, to be held in New Orleans May 20-25, 2012,
3. Member, Scientific program Committee, International free-electron laser conference, 2009, and 2010,
4. Member, Scientific Committee, "Workshop on X-ray FEL R&D", Lawrence Berkeley National Laboratory, October 23-25, 2008,
5. Organizer of the mini-workshop "Advanced Accelerator R&D at the International Linear Collider Test Accelerator", held at Fermilab on November 28$^{th}$, 2006,
6. Convener, "Charged-Particle Sources, Diagnostics and Controls" Working Group at the Advanced Accelerator Concepts (AAC 2006) Workshop (Lake Geneva, WI 07/2006).